Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	
Spectrum Needs of Emergency Response Providers	)	WT Docket No. 05-157
	)	

COMMENTS OF MOTOROLA, INC.

The Intelligence Reform and Terrorism Prevention Act of 2004 requires the Federal Communications Commission ("FCC" or "Commission") to provide Congress with a report by December 17, 2005, that analyzes the short-term and long-term spectrum needs of emergency response providers, including whether or not an additional allocation of spectrum should be granted by Congress to such emergency response providers.[1] In accordance with a recently released *Public Notice*,[2] Motorola, Inc. ("Motorola") hereby submits these comments to assist the Commission in the preparation of this timely study. As the leading radio communications equipment supplier to emergency responders, Motorola is well qualified to provide information on Public Safety's operational trends and spectrum requirements.

I. INTRODUCTION

For over 80 years, radio spectrum has played a major role in how Public Safety entities have been able to effectively protect American citizens and property. The ability for instant communication between and among Public Safety employees has proven to be critical to

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[1] Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. 108-458, § 7502(d) (2004).

[2] *Public Notice*, "Federal Communications Commission Requests Comment on Spectrum Needs of Emergency Response Providers," WT Docket No. 05-157, FCC 05-80 (rel. Mar. 29, 2005).

ensuring that first responders can react quickly and effectively to any emergency. While voice communications have dominated the demand in the past, we are now in the early stages of a transition where emergency responders will need instant access to high-speed broadband and wideband wireless services for the improved dissemination of video and graphic images necessary to defuse dangerous and/or violent situations. These more bandwidth-intensive applications will only be possible with adequate allocations of dedicated spectrum.

The last substantive study of Public Safety's spectrum needs occurred in the mid-1990's when the FCC and the NTIA convened the Public Safety Wireless Advisory Committee ("PSWAC") to evaluate the wireless communications needs of federal, state, and local Public Safety agencies through the year 2010 and recommend possible solutions.[3] While the PSWAC Final Report was indeed a comprehensive and exhaustive review of Public Safety's spectrum needs, it is clear that technology has undergone dramatic changes over the past nine years. More importantly, the events of September 11, 2001, further elevated the role that Public Safety communications systems would play in enhancing U.S. homeland security.

Motorola believes that the PSWAC Final Report is an appropriate starting point for the Commission's current analysis of the spectrum needs of Public Safety. Starting with this report as a baseline, the Commission should use this proceeding to refresh both the information and the analysis in the PSWAC Final Report to reflect changed circumstances in both the technology and spectrum demand that impact the spectrum requirements of Public Safety.

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[3] *See* Final Report of the Public Safety Wireless Committee to the Federal Communications Commission and the National Telecommunications and Information Administration, Public Safety Wireless Committee, September 11, 1996, available at http://pswac.ntia.doc.gov/pubsafe/publications/PSWAC_AL.PDF. ("*PSWAC Final Report*").

Motorola believes that the FCC will ultimately find that the PSWAC Committee did an excellent job in realistically assessing Public Safety's spectrum needs and that many of its recommendations remain valid today. PSWAC strived to look forward as much as possible by estimating improvements in spectrum efficiency and also provided a realistic assessment on the growing reliance by Public Safety users on commercial systems. As further discussed below, Motorola believes that the PSWAC recommendations may need to be augmented in the amount of spectrum needed for wide-area broadband networks. Also, though the primary focus of the FCC effort is appropriately placed on state and local emergency responders, the Commission should also consider the needs of federal agencies, critical infrastructure providers and non-governmental critical infrastructure personnel who respond in emergency situations to provide a more holistic understanding of the spectrum needs of all the organizations responsible for homeland security.

II. IMPLEMENTATION OF PSWAC SPECTRUM RECOMMENDATIONS

The *PSWAC Final Report* recognized the important role that wireless services play in the functioning of Public Safety. It noted that wireless communications are essential to emergency responders both during large-scale disasters and day-to-day emergencies.[4] It also found that the allocation of spectrum at the time was not sufficient for the growing needs of Public Safety.

PSWAC identified all of the current bands available to Public Safety. At the time, there were "a total of 941 channels in six frequency bands" available to Public Safety, including spectrum in the VHF Low Band, the VHF High Band, the 220 MHz SMR Band, the UHF Low

[4] *Id.* at 5.

Band, the 800 MHz Band, and, in some areas, UHF TV Sharing. In all, PSWAC estimated that approximately 23.2 MHz of spectrum was available for Public Safety.[5]

After analyzing the then-available spectrum for Public Safety, PSWAC identified spectrum needs through 2010. According to PSWAC, by the year 2010, Public Safety would need a total of approximately 129.3 MHz of spectrum in order to fully meet its needs. This included spectrum for voice, data, and status/messaging.[6] This spectrum estimate took into account several important factors, including population and demographic changes, the number of Public Safety personnel in 2010, potential technological advances, and the proportion of future spectrum needs that could reasonably be satisfied by commercial services.[7]

Since the completion of the report, the Commission has acted to make more spectrum available to Public Safety. Most notably, the Commission's decision to allot 50 MHz of spectrum in the 4.9 GHz band increased spectrum availability significantly, and fulfilled the goal set by the PSWAC report to provide 50 MHz of spectrum for "Special Data" services.[8]

The full availability of additional spectrum for Public Safety allocated or identified by the Commission has been delayed because the spectrum remains encumbered by legacy users. For example, the increased spectrum that Public Safety will have available as a result of the 800 MHz rebanding will only start being available in late 2007, with full availability sometime in mid-2008.

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5 *Id.* at 16.

6 *Id.* at 54-55.

7 *Id.* at 53-54.

8 *See 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32, Second Report and Order and Further Notice of Proposed Rulemaking, 17 FCC Rcd 3955 (2002); *4.9 GHz Band Transferred from Federal Government Use*, Memorandum Opinion and Order and Third Report and Order, 18 FCC Rcd 9152 (2003).

Most importantly, however, the 24 MHz that was allotted in the 700 MHz band[9] remains unavailable in most major metropolitan areas until television broadcasters hand over their analog spectrum. Although the deadline is currently scheduled for December 31 of 2006, a loophole in the law allowing TV broadcasters to remain indefinitely based on DTV availability makes this transition date very unlikely.[10] The critical nature of this spectrum and the negative effect of the delay in the handover cannot be overstated, as many metropolitan areas need this spectrum to provide critical voice and narrowband data services. It should be a top priority of the Commission to make this spectrum available as soon as possible, by ensuring a timely handover of the analog spectrum.

III. CHANGES SINCE THE PSWAC FINAL REPORT

The *PSWAC Final Report* was the culmination of a thorough consideration of the many factors affecting Public Safety's needs. Unfortunately, no study, regardless of how thorough, could have foreseen the significant changes in the needs of Public Safety agencies to coordinate Homeland Security operations or the considerable technological advances since the mid-1990s. Specifically, Motorola believes that the need for broadband data capability on a wide-area basis and the need for federal government agencies to have access to this broadband data are the most significant considerations facing the Commission in determining the spectrum needs of Public Safety.

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9 See generally The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, First Report and Order and Third Notice of Proposed Rulemaking, 14 FCC Rcd 152 (1998)

10 *See* 47 U.S.C. § 309(j)(14) (2005).

A. Public Safety Entities Need Access to Broadband Services Over a Wide Area

The *PSWAC Final Report* considered the need for broadband data capability over a relatively localized area. However, today's increased Homeland Security requirements dictate a need for data-intensive information sharing over much larger areas.

Motorola classifies Public Safety information content into four "tiers," going from low data rate transferring small amounts of data to very high data rates transferring extremely large amounts of data.[11] Tier 1 applications, such as database queries, can be accomplished on narrowband spectrum. Many of the Tier 2 and 3 applications can be provided over wideband and existing broadband allocations. Tier 4, however, includes real time, high quality, full motion video, which can be used both for remote viewing and manipulation (slow motion) and biometric identification. Providing the broadband, wide-area, mobile coverage required for Tier 4 applications generally requires spectrum below 3 GHz. No spectrum currently available fully satisfies Public Safety tier 4 services requirements. Without the ability to use these services, emergency responders will not have information necessary to respond as effectively as possible to emergencies, and Public Safety agencies will be at a disadvantage as they fulfill their homeland security responsibilities to the public.

Motorola believes that the Commission should allocate dedicated spectrum for the provision of these Tier 4-type services. While it may be possible to meet some of Public Safety's requirements using commercial services, it is critical that Public Safety have dedicated spectrum for mission critical applications.[12] At this time, only dedicated systems give Public

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[11] See the attached slide providing a pictorial representation on the various tiers of public safety communications applications.

[12] PSWAC estimated that approximately 10 percent of the required Public Safety services could be provided by commercial services. It specifically noted that for mission critical applications, the "minimum baseline requirements" were "not met by any existing or planned

Safety entities sufficient power to ensure that the system has the security, flexibility, control, capacity, coverage and features necessary to meet their Public Safety mission.

In fact, Public Safety entities are actively seeking ways to deploy such systems. In Washington, DC, the District of Columbia Office of the Chief Technology Officer ("OCTO") has deployed a citywide broadband wireless system that provides "applications that allow first responders to use video communication and other tools to enhance Public Safety."[13] This system operates under an experimental license in the 700 MHz band,[14] and an additional temporary site on this system was recently used during the Presidential inauguration to assist Public Safety.[15]

In order to continue and even expand OCTO into a regional system, and to establish similar systems in other metropolitan areas, suitable additional dedicated spectrum will have to be allocated to Public Safety.

B. Federal Agencies Also Need Access to Broadband Data Provided Over Dedicated Spectrum

The *PSWAC Final Report* notes that future federal spectrum requirements could be satisfied in the currently allocated spectrum.[16] The spectrum currently available to federal agencies is in the 30-50 MHz band, the 13-150.8 MHz band, the 162-174 MHZ band, 380-400 MHz (for Department of Defense use only) and the 406.1-420 MHz band. These bands are

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[commercial] offerings" and had to be provided on dedicated spectrum. *PSWAC Final Report* at 54. Motorola contends that this statement largely holds true today.

13 *See* OCTO Press Release, "First-of-a-Kind Public Safety Network Unveiled," *available at* http://www.spectrumcoalition.dc.gov/img/spectrum_pressrelease.pdf.

14 *See* Experimental License File No. 0042-EX-ML-2004, Callsign WD2XHO, at https://gullfoss2.fcc.gov/prod/oet/cf/els/reports/442_Print.cfm?mode=initial&application_seq=29457&license_seq=29730.

15 *See* Application for Special Temporary Authority, Callsign WD2XHO, at https://gullfoss2.fcc.gov/prod/oet/cf/els/reports/STA_Print.cfm?mode=current&application_seq=28574.

16 PSWAC Final Report at 650.

congested and used only for narrowband voice and low-speed data transfer. In order to fully participate in homeland security efforts, like those undertaken during the inaugural celebration, federal agencies will need access to broadband data-capable spectrum. Accordingly, it is important to identify suitable spectrum to meet those needs.

Motorola reiterates the importance of providing these agencies with dedicated spectrum. While commercial services could be used for non-mission critical activities like communicating with the public or administrative and government services requirements, Motorola's experience has been that only dedicated systems provide the appropriate reliability, features, and flexibility needed by Public Safety.

IV. CONCLUSION

Motorola commends the Commission for their continuing commitment to providing sufficient spectrum for Public Safety. While the Commission's recent efforts to provide this spectrum have been significant, the fact remains that Public Safety today requires access to wide area broadband data services, especially video services, and that no current allocation can accommodate this service. The Commission should ensure that Public Safety has access to dedicated spectrum to meet this demand. The solution should also be part of an overall plan for meeting Homeland Security requirements, including the communication needs of federal agencies and critical infrastructure providers. The Commission should work closely with the NTIA to develop this comprehensive plan, ensuring that federal agencies have sufficient spectrum for broadband uses, and that federal, state and local agencies, and even critical infrastructure entities, have interoperable equipment.

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Tiered Application Requirements

Information Applications will Improve Capabilities

Tier 1 Apps

- **Database** Queries
- License Plates
- Drivers License
- Other Databases
- Dispatch Officers

- TX Messenger

-Text Messages

-AVL (Constrained)

•OTAR, OTAP

Tier 2 Apps (Tier 1 +)

-Field Reporting

-**Intranet** and Internet Access (Constrained)

- Air Mobile (Text, Video, Image by WLAN)
- Radio IP (compression m/w)
- Portable Devices (Symbol/RIM)

•Citation (inspections, tickets, field interviews)

•Mobile ID (Unconstrained)

•Simple Web Browser Queries

•Enhanced AVL (all units)

Tier 3 Apps (Tier 2+)

Unconstrained Access to Intranet/ Internet

- **Video** & Images To and From Field

•Remote Camera Viewing

•In vehicle video to dispatch, accident

•Photo Lineups

•Remote Camera Viewing

•Traffic, School, Citycams

Tier 4: Apps (Tier 3+)

- Real Time **High Quality Full Motion Video** From Field/To Field
- Real Time Slow Motion Video From Field/To Field
- Conversational Voice/Video
- Remote Camera Viewing and Control

•Biometric applications for positive identification and authentication

Narrowband | **Wideband** | **Broadband**

LOCAL

WIDE AREA